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ABSTRACT:

PROBLEM TO BE SOLVED: To make a hard disk device, having a base disposed with a disk and an actuator and a cover for covering this base lighter in weight, simpler in production process and lower in manufacturing cost.

SOLUTION: A cover 23A of the hard disk device, having a base 22 disposed with a disk 24 rotated by a motor 25 and an actuator 26 for moving a head 29 relative to the disk 24, and the cover 23A for covering the base 22 is constituted by integrally molding a metal plate 33 and a resin part 36, with which the cover 23A is made light in weight, simpler in the production process and lower in manufacturing cost.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, in the conventional hard disk drive unit 1, since the base 2 and covering 3 were aluminum casts, while the production process was complicated, there was a trouble that a manufacturing cost became high. That is, when manufacturing the base 2 and covering 3 by aluminum casting, a fabricating process increases. When manufacturing the base 2 and covering 3 by aluminum casting, specifically, the fabricating of a deburring process, annealing down stream processing, a hole down processing process, a washing process, a painting process, a cutting process and a washing process, and a large number is needed after casting. For this reason, the production process of a hard disk drive unit 1 will become complicated, and the rise of a fall and product cost will arise [manufacture effectiveness].

[0008] Moreover, although lightweight-ization is attained from the field of lightweight-izing compared with the configuration using iron material by making the ingredient of the base 2 and covering 3 into aluminum die casting also conventionally, in the case of an aluminum cast, there is a limit in lightweight-ization, and there is a trouble that it cannot fully reply to the demand of lightweight-izing therefore demanded of the hard disk drive unit 1 in recent years. On the other hand, although what formed covering 3 with the aluminum plate from the field of lightweight-izing is offered, when the rotational frequency of a motor 5 became 7000 rotation extent and rigidity is pursued with the covering 3 which consists only of an aluminum plate, there are many problems.

[0009] Moreover, the actuator 6 used conventionally had the trouble of the weight being heavy since the head arm section 7 was formed with metals, such as aluminum, and becoming the hindrance which therefore gathers a seeking rate. Furthermore, since the packing 15 conventionally prepared in the joint of the base 2 and covering 3 was a rubber sheet, an attachment activity is difficult for it. Furthermore, since the desiccating agent was also pasted up and fixed to the tooth back after manufacture of covering 2 with the double-sided tape, fixed processing was troublesome.

[0010] This invention is made in view of the above-mentioned point, and it aims at offering the hard disk drive unit which can aim at simplification of lightweight-izing and a production process, and reduction of product cost.

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PRIOR ART

[Description of the Prior Art] Drawing 1 shows the hard disk drive unit 1 which is a conventional example. As shown in this drawing, if the profile of the hard disk drive unit 1 is carried out, it is constituted by the base 2 and covering 3. The base 2 is manufactured by carrying out machining, tap processing, etc. which perform dimension **** in the casting formed of aluminum casting. Tap processing is carried out in order to form the screw section (tap section) on which the fixed screw which fixes the base 2 to electronic equipment etc. is screwed.

[0003] While a motor 5 and actuator 6 grade are arranged in the upper part of this base 2, the circuit board 10 is arranged by the lower part. A motor 5 is a direct drive motor and does so the function to rotate the disk 4 used as a magnetic-recording medium at a predetermined rotational frequency. Moreover, the actuator 6 is constituted by the head arm section 7 and the coil section 8. The magnetic head 9 (only henceforth a head) which performs record regeneration to a disk 4 is formed at the tip of the head arm section 7.

[0004] Moreover, by constituting a voice coil motor (VCM) with the magnet which is not illustrated, and impressing a signal lamp to the coil section 8, the head arm section 7 rotates and the coil section 8 has the composition of moving a head 9 to the predetermined location on a disk 4 in connection with this. The above mentioned head arm section 7 is formed of metal material, and the coil section 8 is formed with the resin ingredient. And this head arm section 7 and the coil section 8 have composition formed in one. Thus, by forming the head arm section 7 with a metallic material, a shielding effect can be obtained and it can prevent that a noise therefore mixes in a signal at the time of record playback.

[0005] On the other hand, covering 3 is formed of aluminum casting like the base 2. While the vibration-deadening plate 14 for controlling vibration generated in a hard disk drive unit 1 is arranged by this covering 3, the motor fixed screw 11 which fixes a motor 5, and the actuator fixed screw 12 which fixes an actuator 6 are arranged by it. Moreover, in order to perform moisture absorption in a hard disk drive unit 1, the drying agent which is not illustrated has pasted up using the double-sided tape.

[0006] Moreover, since it is necessary to join airtightly the above mentioned base 2 and above mentioned covering 3, rubber packing 15 is arranged in the location (margo-inferior section) adjacent to the base 2 of covering 3. This rubber packing 15 was arranged by using adhesives for the margo-inferior section of covering 3, and pasting it.

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EFFECT OF THE INVENTION

[Effect of the Invention] According to this invention, the various effectiveness described below is realizable like ****. According to invention according to claim 1, lightweight-izing of covering, low-cost-izing, and simplification of the production process of covering can be attained. Moreover, according to invention according to claim 2, a vibration-deadening plate will function as some coverings, and reduction of components mark and simplification of assembly operation can be attained.

[0053] Moreover, according to invention according to claim 3, it can prevent that oxidation and corrosion occur in a metal plate. Moreover, according to invention according to claim 4, the seal nature in the interface section of a metal plate and resin can be raised more. Moreover, according to invention according to claim 5, the end face of a metal plate which cannot perform surface treatment easily can be protected certainly, and it can prevent more certainly that oxidation and corrosion occur in a metal plate.

[0054] Moreover, according to invention according to claim 6, the junction force of the metal plate and resin which were really fabricated can be hardened, and improvement in dependability can be aimed at. Moreover, according to invention according to claim 7, simplification of the production process of covering can be attained compared with the configuration which forms the pocket made of resin separately. Moreover, according to invention according to claim 8, an elastomer functions as a packing member which makes covering and the base airtight, and since an elastomer is formed of the resin, two color molding, or double shot molding which constitutes covering, simplification of the production process of covering can be attained.

[0055] Moreover, while being able to attain further lightweight-ization by having formed the base with resin according to invention according to claim 9, simplification of the production process of a hard disk drive unit can be attained. Moreover, according to invention according to claim 10, a shielding effect can be obtained for the base also as a product made of resin, and the effect of the disturbance at the time of actuation of a hard disk drive unit can be eliminated.

[0056] Moreover, while becoming possible to arrange the piece of a metal tap in the arbitration location of the base according to invention according to claim 11, since the piece of a tap becomes with a metal, strong immobilization can be performed to fixed part material. Furthermore, according to invention according to claim 12, while being able to attain lightweight-izing of an actuator, and simplification of a production process, since conductive surface treatment is performed, the head arm section can maintain shielding nature.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates the base in which the hard disk drive unit was started, especially the disk and the actuator were arranged, and this base to the hard disk drive unit which has wrap covering. In recent years, the demand of the miniaturization to a portable personal computer and lightweight-izing tends to become strong increasingly. Therefore, also in the hard disk drive unit carried in this kind of personal computer, it is necessary to attain further miniaturization and lightweight-ization.

[0002]

[Description of the Prior Art] Drawing 1 shows the hard disk drive unit 1 which is a conventional example. As shown in this drawing, if the profile of the hard disk drive unit 1 is carried out, it is constituted by the base 2 and covering 3. The base 2 is manufactured by carrying out machining, tap processing, etc. which perform dimension **** in the casting formed of aluminum casting. Tap processing is carried out in order to form the screw section (tap section) on which the fixed screw which fixes the base 2 to electronic equipment etc. is screwed.

[0003] While a motor 5 and actuator 6 grade are arranged in the upper part of this base 2, the circuit board 10 is arranged by the lower part. A motor 5 is a direct drive motor and does so the function to rotate the disk 4 used as a magnetic-recording medium at a predetermined rotational frequency. Moreover, the actuator 6 is constituted by the head arm section 7 and the coil section 8. The magnetic head 9 (only henceforth a head) which performs record regeneration to a disk 4 is formed at the tip of the head arm section 7.

[0004] Moreover, by constituting a voice coil motor (VCM) with the magnet which is not illustrated, and impressing a signal lamp to the coil section 8, the head arm section 7 rotates and the coil section 8 has the composition of moving a head 9 to the predetermined location on a disk 4 in connection with this. The above mentioned head arm section 7 is formed of metal material, and the coil section 8 is formed with the resin ingredient. And this head arm section 7 and the coil section 8 have composition formed in one. Thus, by forming the head arm section 7 with a metallic material, a shielding effect can be obtained and it can prevent that a noise therefore mixes in a signal at the time of record playback.

[0005] On the other hand, covering 3 is formed of aluminum casting like the base 2. While the vibration-deadening plate 14 for controlling vibration generated in a hard disk drive unit 1 is arranged by this covering 3, the motor fixed screw 11 which fixes a motor 5, and the actuator fixed screw 12 which fixes an actuator 6 are arranged by it. Moreover, in order to perform

moisture absorption in a hard disk drive unit 1, the drying agent which is not illustrated has pasted up using the double-sided tape.

[0006] Moreover, since it is necessary to join airtightly the above mentioned base 2 and above mentioned covering 3, rubber packing 15 is arranged in the location (margo-inferior section) adjacent to the base 2 of covering 3. This rubber packing 15 was arranged by using adhesives for the margo-inferior section of covering 3, and pasting it.

[0007]

[Problem(s) to be Solved by the Invention] However, in the conventional hard disk drive unit 1, since the base 2 and covering 3 were aluminum casts, while the production process was complicated, there was a trouble that a manufacturing cost became high. That is, when manufacturing the base 2 and covering 3 by aluminum casting, a fabricating process increases. When manufacturing the base 2 and covering 3 by aluminum casting, specifically, the fabricating of a deburring process, annealing down stream processing, a hole down processing process, a washing process, a painting process, a cutting process and a washing process, and a large number is needed after casting. For this reason, the production process of a hard disk drive unit 1 will become complicated, and the rise of a fall and product cost will arise [manufacture effectiveness].

[0008] Moreover, although lightweight-ization is attained from the field of lightweight-izing compared with the configuration using iron material by making the ingredient of the base 2 and covering 3 into aluminum die casting also conventionally, in the case of an aluminum cast, there is a limit in lightweight-ization, and there is a trouble that it cannot fully reply to the demand of lightweight-izing therefore demanded of the hard disk drive unit 1 in recent years. On the other hand, although what formed covering 3 with the aluminum plate from the field of lightweight-izing is offered, when the rotational frequency of a motor 5 became 7000 rotation extent and rigidity is pursued with the covering 3 which consists only of an aluminum plate, there are many problems.

[0009] Moreover, the actuator 6 used conventionally had the trouble of the weight being heavy since the head arm section 7 was formed with metals, such as aluminum, and becoming the hindrance which therefore gathers a seeking rate. Furthermore, since the packing 15 conventionally prepared in the joint of the base 2 and covering 3 was a rubber sheet, an attachment activity is difficult for it. Furthermore, since the desiccating agent was also pasted up and fixed to the tooth back after manufacture of covering 2 with the double-sided tape, fixed processing was troublesome.

[0010] This invention is made in view of the above-mentioned point, and it aims at offering the hard disk drive unit which can aim at simplification of lightweight-izing and a production process, and reduction of product cost.

[0011]

[Means for Solving the Problem] In order to solve the above-mentioned technical problem, in this invention, it is characterized by providing each means expressed below. Invention according to claim 1 is characterized by considering said covering as the configuration which really fabricated a metal plate and resin in the hard disk drive unit which has wrap covering for the base which comes to arrange the actuator to which a head is moved to the disk and this disk which rotate by the motor, and this base.

[0012] Moreover, invention according to claim 2 is characterized by using said metal plate as a vibration-deadening plate in said hard disk drive unit according to claim 1. Moreover, invention according to claim 3 is characterized by performing surface treatment to the front face of said

metal plate in said hard disk drive unit according to claim 1 or 2.

[0013] Moreover, invention according to claim 4 is characterized by sticking the covering seal of said covering which carries out the seal of this interface section to the interface section of said metal plate and said resin at least in said hard disk drive unit according to claim 1 to 3. Moreover, invention according to claim 5 is characterized by really fabricating the resin for protection which protects the end face of said metal plate around the hole formed in the fixed part of said motor, and the hole formed in the fixed part of said actuator to said metal plate in said hard disk drive unit according to claim 1 to 4.

[0014] Moreover, invention according to claim 6 is characterized by forming the junction force enhancement section in said metal plate in the joint of said metal plate and said resin in said hard disk drive unit according to claim 1 to 5. Moreover, in said hard disk drive unit according to claim 1 to 6, invention according to claim 7 is characterized by really fabricating this pocket made of resin to said metal plate while it prepares the pocket made of resin which arranges a drying agent inside said covering.

[0015] Moreover, in said hard disk drive unit according to claim 1 to 7, invention according to claim 8 arranges an elastomer in the location with said base of said covering which counters, and is characterized by forming this elastomer by the resin, two color molding, or double shot molding which constitutes said covering.

[0016] Moreover, invention according to claim 9 is characterized by forming said base with resin in said hard disk drive unit according to claim 1 to 8. Moreover, invention according to claim 10 is characterized by performing conductive surface treatment to said base in said hard disk drive unit according to claim 9.

[0017] Moreover, invention according to claim 11 is characterized by really fabricating the piece of a metal tap in which the tap section for fixing said base to fixed part material was formed at said base in said hard disk drive unit according to claim 9 or 10. Furthermore, in said hard disk drive unit according to claim 1 to 11, invention according to claim 12 is characterized by performing conductive surface treatment to said head arm section while it really carries out the coil section and the head arm section which constitute said actuator after shaping with resin.

[0018] The various above-mentioned stages act as follows. According to invention according to claim 1, by having considered covering as the configuration which really fabricated a metal plate and resin, resin can be used for the part by which rigidity does not need other rigidity for a required part using a metal plate in covering, and lightweight-izing of covering, low-cost-izing, and simplification of the production process of covering can be attained.

[0019] Moreover, according to invention according to claim 2, by having used the metal plate as a vibration-deadening plate, a vibration-deadening plate will function as some coverings, and reduction of components mark and simplification of assembly operation can be attained. Moreover, according to invention according to claim 3, it can prevent that oxidation and corrosion occur in a metal plate by performing surface treatment on the surface of a metal plate.

[0020] Moreover, according to invention according to claim 4, seal nature can be raised more by [of covering] having stuck the covering seal on the interface section of a metal plate and resin at least. Moreover, by according to invention according to claim 5, having prepared the resin for protection which protects the end face of a metal plate in the perimeter of the hole formed in the fixed part of a motor, and the hole formed in the fixed part of an actuator, and having really fabricated the resin for protection of a parenthesis to the metal plate, the end

face of a metal plate which cannot perform surface treatment easily can be protected certainly, and it can prevent more certainly that oxidation and corrosion occur in a metal plate.

[0021] Moreover, according to invention according to claim 6, by having formed the junction force enhancement section in the metal plate in the joint of a metal plate and resin, the junction force of the metal plate and resin which were really fabricated can be hardened, and improvement in dependability can be aimed at. Moreover, while preparing the pocket made of resin which arranges a drying agent inside covering according to invention according to claim 7, compared with the configuration which forms the pocket made of resin separately, simplification of the production process of covering can be attained by having really fabricated this pocket made of resin to the metal plate.

[0022] Moreover, according to invention according to claim 8, this elastomer functions as a packing member which makes covering and the base airtight by arranging an elastomer in the location with the base of covering which counters. Moreover, since an elastomer is formed of the resin, two color molding, or double shot molding which constitutes covering, it can be formed in one with covering and can attain simplification of the production process of covering.

[0023] Moreover, while being able to attain further lightweight-ization by having formed the base with resin according to invention according to claim 9, simplification of the production process of a hard disk drive unit can be attained. Moreover, according to invention according to claim 10, by having performed conductive surface preparation to the base, a shielding effect can be obtained for the base also as a product made of resin, and the effect of the disturbance at the time of actuation of a hard disk drive unit can be eliminated.

[0024] Moreover, while becoming possible to arrange the piece of a metal tap in the arbitration location of the base by having really fabricated the piece of a metal tap in which the tap section for fixing the base to fixed part material was formed at the base made of resin according to invention according to claim 11, since the piece of a tap becomes with a metal, strong immobilization can be performed to fixed part material.

[0025] Furthermore, according to invention according to claim 12, lightweight-izing of an actuator and simplification of a production process can be attained by really carrying out the coil section and the head arm section which constitute an actuator after shaping with resin. Moreover, by having performed conductive surface treatment to the head arm section, even if it forms the head arm section with resin, shielding nature can be maintained.

[0026]

[Embodiment of the Invention] Next, the gestalt of operation of this invention is explained with a drawing. Drawing 2 thru/or drawing 7 are drawings for explaining hard disk drive unit 20A which is the 1st example of this invention. Drawing 2 is the sectional view showing a whole hard disk drive unit 20A configuration, and drawing 3 thru/or drawing 7 are drawings expanding and showing each important section of hard disk drive unit 20A.

[0027] As shown in drawing 2, if the profile of the hard disk drive unit 20A is carried out, it is constituted by the base 22, covering 23, the motor 25, and the actuator 26 grade. In this example, the base 22 is formed with resin. As this resin ingredient, it is possible to use the rigid resin of an epoxy system, for example. By forming the base 22 with resin, it is possible to fabricate the base 22 with a sufficient precision compared with casting which could form the base 22 in package using the resin mold method, and was performed conventionally.

[0028] It becomes unnecessary to perform fabricating needed in casting currently performed

conventionally, and, therefore, simplification of a production process can be attained. Moreover, since resin is lightweight compared with the aluminum dies casting which was the conventional base ingredient, lightweight-ization of the base 22 can be attained. Therefore, lightweight-ization of hard disk drive unit 20A can be attained by forming the base 22 with resin.

[0029] Conductive surface treatment is performed to the base 22 formed as mentioned above. As an approach of performing this conductive surface preparation, ion plating is used by this example. Moreover, conductive metals, such as aluminum, are used as an evaporation source which performs ion plating. Thus, by performing conductive surface preparation at the base 22, a shielding effect can be obtained for the base 22 also as a product made of resin, and the effect of the disturbance at the time of actuation of hard disk drive unit 20A can be eliminated. Moreover, it can perform adhesion and that it is attached and the surroundings form the conductive film of high membranous quality good by using ion plating for what performs conductive surface preparation.

[0030] By the way, when it carries hard disk drive unit 20A in electronic equipment (for example, portable personal computer etc.), fixing the base 22 to the case of electronic equipment is performed. Therefore, as shown in drawing 7 (A), the piece 48 of a tap is arranged in the predetermined location of the base 22. This piece 48 of a tap is a piece of a metal, and the tap section 49 is formed in the predetermined location so that it may expand to drawing 7 (B) and may be shown. This tap section 49 is a part where the fixed screw used in case the base 22 is fixed to the case of electronic equipment is screwed.

[0031] The arrangement location of this piece 48 of a tap changes with the classes and part numbers of electronic equipment, respectively, and that arrangement location is specified by the user side (they are a user youth's so-called components). Therefore, with the configuration which forms the tap section 49 in the base 22 made of resin directly, metal mold is needed for every class of electronic equipment, or part number, and it is inefficient-like. So, in this example, it considered as the configuration which arranges the piece 48 of a tap in the base 22 in one by making the piece 48 of a tap into the piece of a metal, and carrying out insert molding of this piece 48 of a tap at the time of shaping of the base 22.

[0032] Thus, it becomes possible to arrange the metal piece 48 of a tap to preparation comparatively, without following modification of metal mold on the arbitration location of the base 22 by having considered the base 22 as the configuration which really fabricates to the piece 48 of a tap. Furthermore, while being able to aim at improvement in dependability so that a screw thread may not collapse even if it detaches and attaches a fixed screw since the tap section 49 which the above mentioned fixed screw screws on is formed in the piece 48 of a tap which consists of a metal, it becomes possible to perform strong immobilization to the case of electronic equipment.

[0033] In addition, various circuit elements required in order to perform magnetic-recording regeneration are arranged, for example, the circuit board 30 is being fixed to the tooth back of the base 22 using adhesives etc. The motor 25 and the actuator 26 grade are arranged in the upper part of the base 22 considered as the above-mentioned configuration. A motor 25 is a direct drive motor and does so the function to rotate the disk 24 used as a magnetic-recording medium at a predetermined rotational frequency.

[0034] Moreover, the actuator 26 is constituted by the head arm section 27 and the coil section 28. The magnetic head 29 (only henceforth a head) which performs record regeneration to a disk 24 is formed at the tip of the head arm section 27. Moreover, coil 28A

which constitutes a voice coil motor (VCM) is arranged in the coil section 28 with the magnet which is not illustrated, and by impressing a signal lamp to coil 28A; the head arm section 27 rotates and has the composition of moving a head 29 to the predetermined location on a disk 24 in connection with this.

[0035] the configuration which really carried out the head arm section 27 which constitutes an actuator 26 from this example, and the coil section 28 after shaping with resin -- ** -- it is carrying out. Thus, compared with the configuration which formed the head arm section 7 with the metal like before, lightweight-izing of an actuator 26 and simplification of a production process can be attained by really fabricating the head arm section 27 and the coil section 28 with resin.

[0036] By the way, the shielding nature which is one of the functions which the head arm section 27 has poses a problem by forming the head arm section 27 with resin, as described above. So, in this example, as shown in drawing 4, conductive surface treatment was performed to the head arm section 27. Adhesion and the ion plating in which it is attached and the surroundings can form the conductive film of good and high membraneous quality were used for this conductive surface treatment like the above (in drawing 4, crepe shows the field which carried out ion plating). Thus, it can prevent that can maintain shielding nature as usual also as a product made of resin, and a noise mixes the head arm section 27 in a signal at the time of record playback by performing conductive surface treatment to the head arm section 27.

[0037] Then, covering 23A is explained. In this example, it is characterized by really fabricating a metal plate 33 and the resin section 36 for covering 23A (insert molding). The metal plate 33 has the flat-surface configuration as shown in drawing 5, and the fixed hole 38 in which the screw for fixing covering 23A to the base 22 is inserted is formed in the periphery predetermined location. Moreover, surface treatment is performed to the front face of a metal plate 33, and it has prevented that oxidation and corrosion occur in a metal plate 33.

[0038] This metal plate 33 constitutes the top-plate part of covering 23A which mainly needs rigidity. Moreover, the resin section 36 constitutes the flank which seldom mainly needs rigidity. Thus, lightweight-izing of covering 23A, low-cost-izing, and simplification of a production process can be attained, maintaining the reinforcement of covering 23A by mainly using a metal plate 33 for the part (top-plate part) which needs rigidity, and using the resin section 36 for the part (flank) which does not need other rigidity in covering 23A.

[0039] Here, a part for the joint of a metal plate 33 and the resin section 36 is expanded to drawing 3, and is shown. In this example, the junction force enhancement section which increases the junction force of a metal plate 33 and the resin section 36 is formed in the joint of a metal plate 33 and the resin section 36. In the example shown in drawing 3 (A), the serrate section 45 is formed in the edge joined to the resin section 36 of a metal plate 33, and increase of the junction force is aimed at by making large the plane-of-composition product of a metal plate 33 and the resin section 36 by this. The same is said of the example shown in drawing 3 (B), and by forming the concave heights 46 in the edge joined to the resin section 36 of a metal plate 33, the plane-of-composition product of a metal plate 33 and the resin section 36 is made large, and increase of the junction force is aimed at. Furthermore, in the example shown in drawing 3 (C), adhesives 47 are applied to the edge joined to the resin section 36 of a metal plate 33, and increase of the junction force of a metal plate 33 and the resin section 36 is aimed at by the adhesive strength of these adhesives 47.

[0040] Thus, by forming the junction force enhancement section in the joint of a metal plate

33 and the resin section 36, the junction force of the really fabricated metal plate 33 and the resin section 36 can be hardened, and improvement in the dependability of covering 23A can be aimed at. Return explanation is continued to drawing 2 . The motor fixed screw 31 which fixes the up location of a motor 25, and the actuator fixed screw 32 which fixes the up location of an actuator 26 are arranged by the metal plate 33 considered as the above-mentioned configuration. Furthermore, vibration-deadening plate 34A is arranged in the upper part of a metal plate 33. This vibration-deadening plate 34A is prepared in order to control vibration generated in hard disk drive unit 20A by rotation of a motor 25 etc.

[0041] Moreover, the covering seal 50 is arranged in the topmost part of covering 23A. This covering seal 50 is a thing of covering 23A arranged so that the open air may not leak to the interior of hard disk drive unit 20A from the interface section of a metal plate 33 and the resin section 36 at least. the configuration on which the covering seals 50 including the upper part of this vibration-deadening plate 34A were stuck in this example since vibration-deadening plate 34A was arranged in the upper part of a metal plate 33 -- ** -- it is carrying out. Thus, by forming the covering seal 50, it can prevent that leak occurs in the interface section of a metal plate 33 and the resin section 36, and the dependability of hard disk drive unit 20A can be raised more.

[0042] Furthermore, inside covering 23A, the pocket 39 made of resin for arranging a drying agent 40 is formed. This pocket 39 made of resin is constituted by the pocket section 41 and the covering device 42 so that it may expand to drawing 6 and may be shown. The pocket section 41 is considered as the configuration really fabricated by the metal plate 33. Therefore, the pocket section 41 (pocket 39 made of resin) can be formed separately, and simplification of the production process of covering 23A can be attained compared with the configuration which fixes this to a metal plate 33.

[0043] In addition, in order to equip the pocket 39 made of resin with a drying agent 40, the pocket section 41 is first equipped with a drying agent 40, and the pocket section 41 is lidded by the covering device 42 on it. Two or more bosses 43 are formed in the pocket section 41, and the stoma 44 corresponding to a boss's 43 formation location is formed in the covering device 42. Therefore, the heat caulking of the boss 43 who equipped and projected the covering device 42 in the pocket section 41 on the covering device 42 continuously so that a boss 43 might insert in a stoma 44 is carried out, and a covering device 42 is fixed to the pocket section 41. It is equipped with a drying agent 40 by the above processing by the pocket 39 made of resin.

[0044] The base 22 is equipped with covering 23A considered as the above-mentioned configuration, and covering 23A is combined with the base 22 by inserting a screw in the above mentioned fixed hole 38 (referring to drawing 5), and fixing to the tap section 49 (referring to drawing 7). Under the present circumstances, in this example, it is characterized by arranging an elastomer 35 in the location with the base 22 of covering 23A which counters. This elastomer 35 functions as a packing member which makes covering 23A and the base 22 airtight.

[0045] In case this elastomer 35 forms covering 23A, it is formed in coincidence. That is, in case covering 23A (resin section 36) is formed, the elastomer 35 has composition really fabricated by covering 23A using two color molding or double shot molding. Thus, by using two color molding or double shot molding, an elastomer 35 can be formed in one with covering 23A (resin section 36), and simplification of the production process of covering 23A can be attained.

[0046] Drawing 8 shows hard disk drive unit 20B which is the 2nd example of this invention. In addition, in drawing 8, the same sign is attached about the same configuration as hard disk drive unit 20A concerning the 1st example previously explained using drawing 2 thru/or drawing 7, and the explanation is omitted. Hard disk drive unit 20A concerning the 1st above mentioned example showed the example which constituted a metal plate 33 and vibration-deadening plate 34A as another member. On the other hand, in hard disk drive unit 20B concerning this example, it is characterized by using a metal plate as vibration-deadening plate 34B.

[0047] That is, in this example, the metal plate 33 used in the 1st example is removed, and it is characterized by giving the function of a metal plate 33 to vibration-deadening plate 34B. Therefore, vibration-deadening plate 34B has the resin section 36 and composition formed in one (insert molding). By considering as this configuration, vibration-deadening plate 34B will function as a part of covering 23B, and can attain reduction of components mark, and simplification of assembly operation.

[0048] Drawing 9 shows hard disk drive unit 20C which is the 3rd example of this invention. In addition, also in drawing 9, the same sign is attached about the same configuration as hard disk drive unit 20A concerning the 1st example previously explained using drawing 2 thru/or drawing 7, and the explanation is omitted. In hard disk drive unit 20A concerning the 1st above mentioned example, it considered as the configuration which screws the motor fixed screw 31 and the actuator fixed screw 32 on a motor 25 and an actuator 26 through the hole 54 formed in the metal plate 33. However, with this configuration, the trouble of being easy to generate oxidation and corrosion is in a metal plate 33 from this hole 54. That is, as described above, surface preparation is carried out by the metal plate 33, but in case surface-preparation material cannot adhere to the common-law marriage of a hole 54 easily and each screws 31 and 32 are inserted in, it is also considered that surface-preparation material exfoliates.

[0049] So, in hard disk drive unit 20C concerning this example, it is characterized by forming the motor fixed part 51 and the actuator fixed part 52 in the perimeter of the hole 54 formed in the up fixed part of a motor 25, and the hole 54 formed in the up fixed part of an actuator 26 as resin for protection which protects the end face of vibration-deadening plate 34B (the configuration of the 1st example metal plate 33).

[0050] Both this motor fixed part 51 and the actuator fixed part 52 are formed with resin, and are fabricated according to the time of really fabricating vibration-deadening plate 34B and the resin section 36 at the time of manufacture of covering 23C. Thus, by having really fabricated the motor fixed part 51 and the actuator fixed part 52 to vibration-deadening plate 34B (metal plate), the end face of vibration-deadening plate 34B (metal plate) which cannot perform surface treatment easily can be protected certainly, and it can prevent more certainly that oxidation and corrosion occur in vibration-deadening plate 34B (metal plate).

[0051] Un-arranging seems moreover, not to be generated in fixed processing of each fixed screws 31 and 32, since the screw insertion section 53 is formed so that it may expand to the motor fixed part 51 and the actuator fixed part 52 at drawing 9 (B) and may be shown.

[0052]

[Effect of the Invention] According to this invention, the various effectiveness described below is realizable like ****. According to invention according to claim 1, lightweight-izing of covering, low-cost-izing, and simplification of the production process of covering can be attained. Moreover, according to invention according to claim 2, a vibration-deadening plate

will function as some coverings, and reduction of components mark and simplification of assembly operation can be attained.

[0053] Moreover, according to invention according to claim 3, it can prevent that oxidation and corrosion occur in a metal plate. Moreover, according to invention according to claim 4, the seal nature in the interface section of a metal plate and resin can be raised more.

Moreover, according to invention according to claim 5, the end face of a metal plate which cannot perform surface treatment easily can be protected certainly, and it can prevent more certainly that oxidation and corrosion occur in a metal plate.

[0054] Moreover, according to invention according to claim 6, the junction force of the metal plate and resin which were really fabricated can be hardened, and improvement in dependability can be aimed at. Moreover, according to invention according to claim 7, simplification of the production process of covering can be attained compared with the configuration which forms the pocket made of resin separately. Moreover, according to invention according to claim 8, an elastomer functions as a packing member which makes covering and the base airtight, and since an elastomer is formed of the resin, two color molding, or double shot molding which constitutes covering, simplification of the production process of covering can be attained.

[0055] Moreover, while being able to attain further lightweight-ization by having formed the base with resin according to invention according to claim 9, simplification of the production process of a hard disk drive unit can be attained. Moreover, according to invention according to claim 10, a shielding effect can be obtained for the base also as a product made of resin, and the effect of the disturbance at the time of actuation of a hard disk drive unit can be eliminated.

[0056] Moreover, while becoming possible to arrange the piece of a metal tap in the arbitration location of the base according to invention according to claim 11, since the piece of a tap becomes with a metal, strong immobilization can be performed to fixed part material. Furthermore, according to invention according to claim 12, while being able to attain lightweight-izing of an actuator, and simplification of a production process, since conductive surface treatment is performed, the head arm section can maintain shielding nature.

[Translation done.]

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CLAIMS

[Claim(s)]

[Claim 1] The hard disk drive unit characterized by considering said covering as the configuration which really fabricated a metal plate and resin in the hard disk drive unit which has wrap covering for the base which comes to arrange the actuator to which a head is moved to the disk and this disk which rotate by the motor, and this base.

[Claim 2] The hard disk drive unit characterized by using said metal plate as a vibration-deadening plate in a hard disk drive unit according to claim 1.

[Claim 3] The hard disk drive unit characterized by performing surface preparation to the front face of said metal plate in a hard disk drive unit according to claim 1 or 2.

[Claim 4] The hard disk drive unit characterized by sticking the covering seal of said covering which carries out the seal of this interface section to the interface section of said metal plate and said resin at least in a hard disk drive unit according to claim 1 to 3.

[Claim 5] The hard disk drive unit characterized by really fabricating the resin for protection which protects the end face of said metal plate in a hard disk drive unit according to claim 1 to 4 around the hole formed in the fixed part of said motor, and the hole formed in the fixed part of said actuator to said metal plate.

[Claim 6] The hard disk drive unit characterized by forming the junction force enhancement section in said metal plate in the joint of said metal plate and said resin in a hard disk drive unit according to claim 1 to 5.

[Claim 7] The hard disk drive unit characterized by really fabricating this pocket made of resin to said metal plate while preparing the pocket made of resin which arranges a drying agent inside said covering in a hard disk drive unit according to claim 1 to 6.

[Claim 8] The hard disk drive unit characterized by having arranged the elastomer in the location with said base of said covering which counters, and forming this elastomer in a hard disk drive unit according to claim 1 to 7 by the resin, two color molding, or double shot molding which constitutes said covering.

[Claim 9] The hard disk drive unit characterized by forming said base with resin in a hard disk drive unit according to claim 1 to 8.

[Claim 10] The hard disk drive unit characterized by performing conductive surface preparation to said base in a hard disk drive unit according to claim 9.

[Claim 11] The hard disk drive unit characterized by really fabricating the piece of a metal tap in which the tap section for fixing said base to fixed part material was formed in the hard disk drive unit according to claim 9 or 10 at said base.

[Claim 12] The hard disk drive unit characterized by performing conductive surface preparation to said head arm section while really carrying out the coil section and the head

arm section which constitute said actuator after shaping with resin in a hard disk drive unit according to claim 1 to 11.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is a sectional view for explaining the hard disk drive unit which is a conventional example.

[Drawing 2] It is the sectional view of the hard disk drive unit which is the 1st example of this invention.

[Drawing 3] It is the sectional view expanding and showing a part for the joint of a metal plate and the resin section.

[Drawing 4] It is drawing for explaining the configuration of an actuator.

[Drawing 5] It is the top view expanding and showing a metal plate.

[Drawing 6] It is a perspective view for explaining the configuration of a drying-agent pocket.

[Drawing 7] It is drawing for explaining the configuration of a tap piece.

[Drawing 8] It is the sectional view of the hard disk drive unit which is the 2nd example of this invention.

[Drawing 9] It is the sectional view of the hard disk drive unit which is the 3rd example of this invention.

[Description of Notations]

20A-20C Hard disk drive unit

22 Base

23A-23C Covering

24 Disk

25 Motor

26 Actuator

27 Head Arm Section

28 Coil Section

31 Motor Fixed Screw

32 Actuator Fixed Screw

33 Metal Plate

34A, 34B Damping plate

35 Elastomer

36 Resin Section

39 Drying-Agent Pocket

40 Drying Agent

45 Serrate Section

46 Concavo-convex Section

47 Adhesives
48 Tap Piece
50 Covering Seal
51 Motor Fixed Part
52 Actuator Fixed Part

[Translation done.]

* NOTICES *

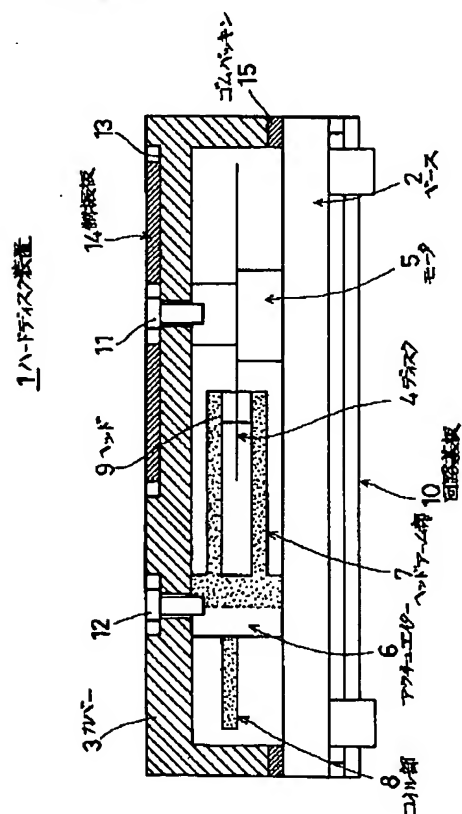
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DRAWINGS

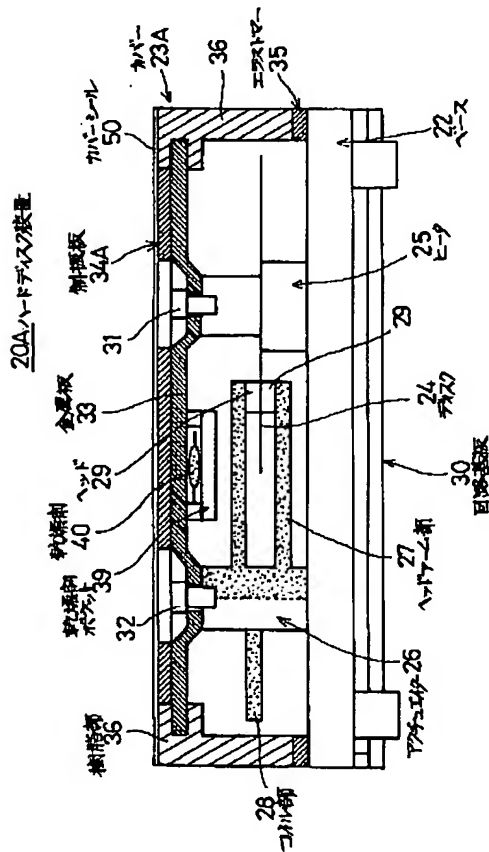
[Drawing 1]

従来の一例であるハードディスク装置を説明するための断面図



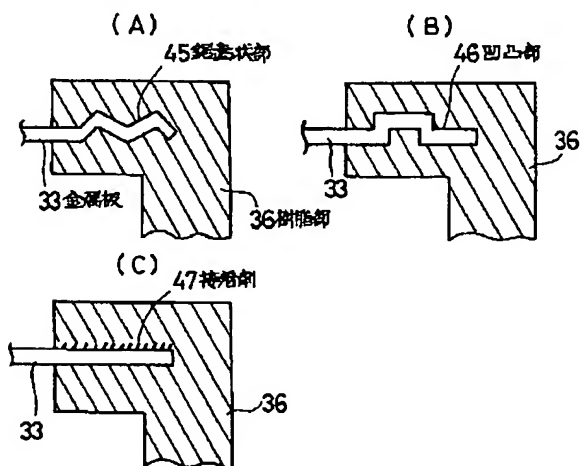
[Drawing 2]

本発明の第1実施例であるハードディスク装置
の断面図



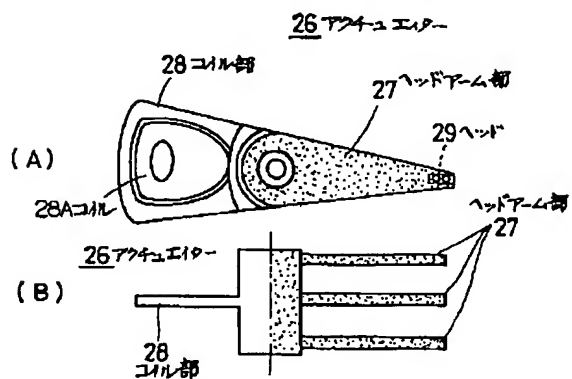
[Drawing 3]

金属板と樹脂部との接合部分を拡大して示す断面図



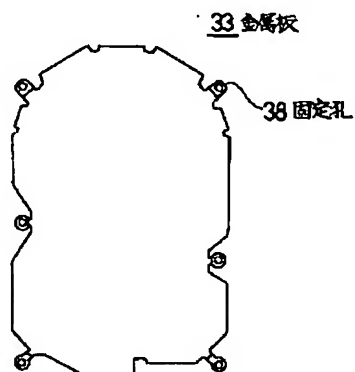
[Drawing 4]

アクチュエータの構成を説明するための図



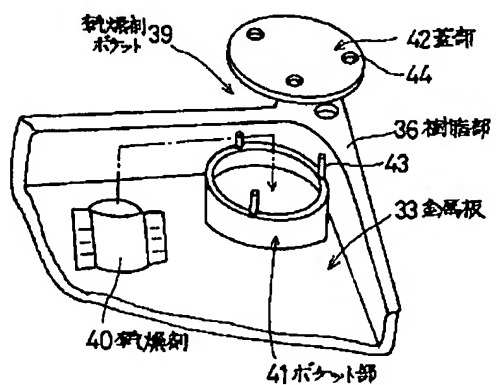
[Drawing 5]

金属板を拡大して示す平面図



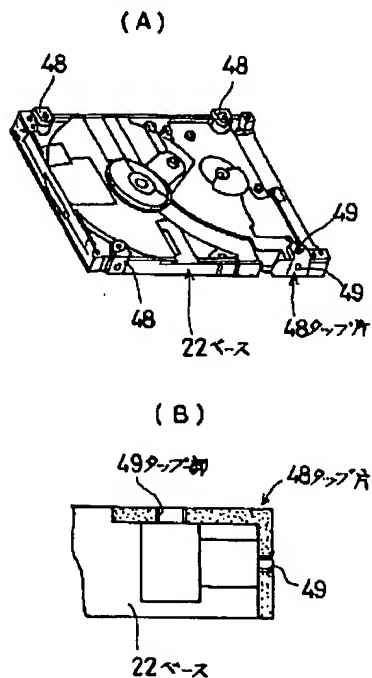
[Drawing 6]

乾燥剤ポケットの構成を説明するための斜視図



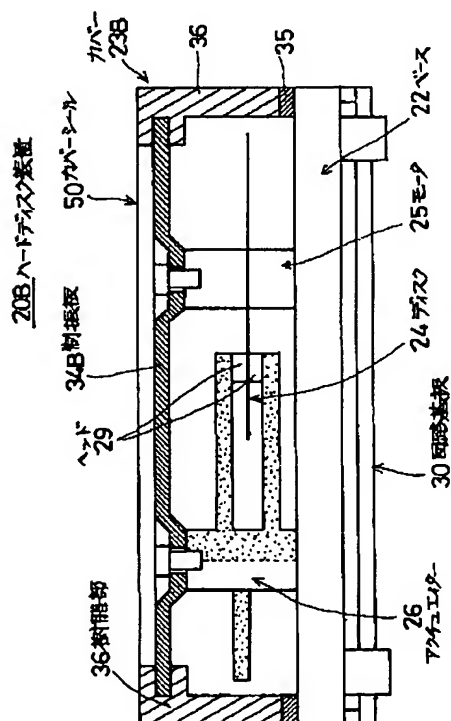
[Drawing 7]

タップ片の構成を説明するための図



[Drawing 8]

本発明の第2実施例であるハードディスク装置の断面図



[Drawing 9]

